

INFORMATION SHEET

ORDER NO. R5-2006-XXXX,

NPDES NO. CA0081485

CUTLER-OROSI JOINT POWERS WASTEWATER AUTHORITY WWTF

TULARE COUNTY

I. INTRODUCTION

The Cutler-Orosi Joint Powers Wastewater Authority (hereinafter Discharger) owns and operates a wastewater treatment facility (WWTF) serving the communities of Cutler, Orosi, East Orosi, Yettem, Seville, and Sultana. The Discharger submitted a report of waste discharge (RWD) dated 20 January 2003 and applied for renewal of its permit to discharge waste under the National Pollutant Discharge Elimination System (NPDES) from its WWTF to Discharger-owned land for irrigation and to Sand Creek, a water of the United States. Waste Discharge Requirements (WDRs) Order No. 97-106 currently regulates the discharge. The U.S. Environmental Protection Agency (USEPA) and the Regional Board have classified the Discharger's WWTF as a major discharger.

According to the RWD, the WWTF has an average effluent flow of 1.35 million gallons per day (mgd) and a design flow of 2.0 mgd. The WWTF includes headworks, grit removal, pump screws, two primary clarifier-digesters, two trickling filters, an oxidation ditch, a secondary clarifier, ultraviolet light (UV) disinfection (used when discharging to surface waters through Discharge 002), two unlined sludge lagoons, and 16 unlined sludge drying beds. Treated wastewater may be stored in one of two unlined holding ponds prior to discharge or discharged directly without storage. The holding ponds have a total pond bottom of 16 acres. Effluent is lost through evaporation and percolation from the holding ponds. The WWTF has two wastewater discharge locations, namely, Discharge 001 and Discharge 002.

Discharge 001 is recycling of wastewater on 106 acres of Discharger owned land, which is in Section 24, T16S, R24E, MDB&M. The Discharger has an additional 20 acres available for irrigation, pending the installation of irrigation piping. The Discharger grows fodder, fiber, and seed crops on the land. Wastewater discharged through Discharge 001 is not disinfected.

The Discharger also is authorized to discharge via Discharge 002 to Sand Creek between 1 November and 30 April. Sand Creek runs parallel to the WWTF on its south and east sides. The Discharger last discharged to Sand Creek in March 2001. Sand Creek is an intermittent stream that carries local storm water runoff southerly to Cottonwood Creek. Sand Creek is usually dry during the summer. Maximum flow capacity is approximately 500 cubic feet per second (cfs), although flows generally do not exceed 5-10 cfs. Sand Creek falls within a group of streams termed Valley Floor Waters, which include streams in Hydrologic Units (HUs) 551, 557, and 558 and not included elsewhere in Table II-1 of the *Water Quality Control Plan for the Tulare Lake Basin, Second Edition* (Basin Plan), adopted in 1985. The beneficial uses designated for Valley Floor Waters (including Sand Creek) are:

- a. Agricultural supply (AGR),
- b. Industrial service supply (IND),
- c. Industrial process supply (PRO),
- d. Water contact recreation (REC-1),
- e. Non-contact water recreation (REC-2),
- f. Warm freshwater habitat (WARM),

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- g. Wildlife habitat (WILD),
- h. Rare, threatened, or endangered species (RARE), and
- i. Groundwater recharge (GWR).

The underlying groundwater is in the Detailed Analysis Unit (DAU) 239 of the King's Basin Hydrologic Unit (HU). The designated beneficial uses of the groundwater are:

- a. Agricultural supply (AGR),
- b. Municipal supply (MUN),
- c. Industrial service supply (IND), and
- d. Industrial process supply (PRO).

Precedential State Board Order No. WQ2002-0015 (Vacaville Order) provides guidance on implementing the Basin Plan, particularly new requirements to protect a beneficial use that is designated but which evidence suggest does not exist in an effluent dominated water body. Some of the issues addressed by the State Board Order may be relevant to the Cutler-Orosi Joint Powers Wastewater Authority discharge. Specifically, the beneficial uses designated for Valley Floor waters that drive the most stringent effluent limitations of this Order are AGR, WARM, and limited REC-1, and Sand Creek may prove to be an exception to the group if these uses were specific to the water body. Other designated beneficial uses, whether they exist or do not, are unlikely to change the effluent limitations of this Order.

II. DESCRIPTION OF EFFLUENT

The discharges are described below based on information from the most recent Report of Waste Discharge and from recent self-monitoring reports.

- a. **Discharge 001:** The quality of the Discharge 001, based on 2000-2005 self-monitoring data, may be described as follows:

Summary of Effluent Data for Discharge 001

<u>Constituent</u>	<u>Average Daily Concentration</u>
BOD ₅ ¹	2.1 mg/L
Total Suspended Solids (TSS)	3.0 mg/L
Settleable Solids	<0.1 mg/L

¹ 5-day, 20°C biochemical oxygen demand

- b. **Discharge 002:** Discharge 002 occurs at a point in Section 19, T16S, R25E, MDB&M (Longitude 119°18'12" West; Latitude 36°31'23" North). The quality of this discharge, based

on self-monitoring data from 2000 and 2001 (May 2001 was the last reported discharge from Discharge 002) may be described as follows:

Summary of Effluent Data for Discharge 002

<u>Constituent</u>	<u>Average Daily Concentration</u>
BOD ₅ ¹	2.4 mg/L
Total Suspended Solids (TSS)	3.8 mg/L
Settleable Solids	<0.1 mg/L

¹ 5-day, 20°C biochemical oxygen demand

III. SUMMARY OF CHANGES TO CURRENT ORDER

The NPDES elements of WDR Order No. 97-106, (hereafter the existing Order), expired on 19 June 2002. This Order includes changes to both the NPDES and non-NPDES elements of Order No. 97-106 and to the Monitoring and Reporting Program. A summary of the key changes is as follows:

a. Discharge 001

- Addition of total suspended solids (TSS) limits based on Basin Plan requirements.
- Addition of 85 percent removal requirement for BOD₅ and TSS based on Basin Plan requirements.
- Revision of total coliform organism maximum daily limit (more stringent) based on Basin Plan requirements.
- Addition of boron and chloride limitations based on Basin Plan requirements.

b. Discharge 002

- Addition of mass-based limits for BOD₅ and TSS calculated from national secondary treatment standards and WWTF design flow.
- Addition of un-ionized ammonia limit based on the Basin Plan water quality objective for ammonia.
- Revision of pH limits (more stringent) based on Basin Plan water quality objective for pH.
- Addition of acute whole effluent toxicity limitations based on the Basin Plan water quality objective for toxicity.

c. Recycled Water Specifications

- Addition of requirement to install backflow preventers.
- Addition of restriction for commercial fertilizer application.

- Minor revisions and additions to setback distance requirements.

d. Receiving Water Limitations

- Minor revisions and additions (e.g., temperature) to receiving water limits to reflect Basin Plan water quality objectives.

e. Groundwater Limitations

- Minor revisions to receiving water limits to reflect Basin Plan water quality objectives.

f. Provisions

- Addition of requirement to conduct a study on California Toxics Rule (CTR) priority pollutants
- Addition of chronic toxicity testing requirements based on the Basin Plan water quality objective for toxicity and Section 4 of the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Plan or SIP).
- Addition of requirement to conduct hydrogeologic investigation to determine areas affected and potentially affected by the WWTF discharge.
- Requirement to evaluate WWTF sludge and operation and maintenance practices with respect to BPTC.
- Addition of requirement to conduct a study to gather information to set numeric groundwater limitations.

g. Monitoring and Reporting Program

- Increase in frequency of BOD₅ and TSS monitoring of influent to weekly to match effluent monitoring frequency.
- Revision of BOD₅ and TSS sampling type to 24-hour flow-proportional composite (from 8-hour composite) to reflect potential fluctuations in influent and effluent quality over a 24-hour period.
- Increase in total coliform organism monitoring frequency of Discharges 001 and 002 to be consistent with Title 22 of the Code of California Regulations (22 CCR) Article 6, §60321 for disinfected secondary-23 recycled water.
- Addition of boron and chloride monitoring of Discharge 001 to measure compliance with new effluent limits.
- Addition of nitrate monitoring, and total nitrogen monitoring frequency to weekly for Discharge 001 based on elevated nitrate levels in groundwater underlying the irrigation area above the MCL for nitrate + nitrite. (Total nitrogen and flow monitoring requirements for Discharge 001 were listed in the existing Monitoring and Reporting Program under “Recycled Water Monitoring”).

- Addition of acute and chronic whole effluent toxicity testing of Discharge 002 to measure compliance with effluent limits and other requirements.
- Addition of un-ionized ammonia monitoring for Discharge 002 and the receiving water to measure compliance with the ammonia limitation and the Basin Plan water quality objective for ammonia.
- Addition of priority pollutant monitoring requirements for effluent and receiving water sampling to complete requirements for letters sent by the Regional Board to the Discharger dated 27 February 2001, 8 May 2001, and 27 February 2002.
- Addition of temperature monitoring in Discharge 002 and the receiving water (Sand Creek) based on Receiving Water Limitations for temperature.
- Addition of hardness monitoring in the receiving water to provide needed data for future reasonable potential analyses.
- Increase in sludge reporting to quarterly based on finding that, at the time of the most recent inspection, sludge from more than two years of WWTF operations was being stored on-site.

IV. SPECIFIC RATIONALE

Several specific factors affecting the development of limitations and requirements in this Order are discussed as follows:

1. Recent WWTF Performance

Effluent monitoring data collected from 2000 to 2005 are considered representative of recent WWTF performance.

2. Basis for Prohibitions

- A.1 The restriction on when effluent can be discharged to Discharge 002 is carried over from Order No. 97-106 and is designed to encourage reclamation.
- A.2 Prohibition of by-pass or overflow of waste streams is based on 40 CFR 122.4(m) and Standard Provision A.13.
- A.3 Discharge of hazardous and designated wastes are prohibited based on the requirements of Title 23, California Code of Regulations (CCR), Section 2510, et seq. and Title 27 CCR, Section 20005 et seq..

3. Basis for Effluent Limitations

Federal regulations at Title 40, Code of Federal Regulations, Part 133.102 (40 CFR 133.102) establish the minimum level of effluent quality attainable by secondary treatment for the parameters BOD₅, TSS and pH. Basin Plans include beneficial uses to be protected, water quality objectives to protect those uses, and a program of implementation needed for achieving the objectives. The following effluent

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limitations have been derived from either 40 CFR 133.102 or the Basin Plan. Some of these limitations are carried over from the existing Order. The WWTF's ability to comply with these effluent limitations is demonstrated by existing performance data.

3.1 Flow

Flow is limited based on the WWTF's certified design capacity of 2.0 mgd.

3.2 Effluent Limitations for Discharge 001

This Order includes the following limits for Discharge 001:

Constituent	Units	Average Monthly Limitation	7-Sample Median	Maximum Daily Limitation
BOD ₅ ¹	mg/L	30	--	60
Total Suspended Solids (TSS)	mg/L	30	--	60
Settleable Solids	ml/L	0.2	--	0.5
Total Coliform Organisms ²	MPN ³ /100 mL	--	23	240
Chloride	mg/L	--	--	175
Boron	mg/L	--	--	1.0

¹ Five-day, 20°C biochemical oxygen demand (BOD)

² Limits apply only when groundwater is less than five (5) feet below ground surface based on groundwater monitoring well data.

³ MPN = Most Probable Number

- The arithmetic mean of 20°C BOD (5-day) and total suspended solids (TSS) in effluent samples collected from Discharge 001 over a monthly period shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85 percent removal).
- The maximum EC of the discharge shall not exceed the source water EC (at 25°C) plus 500 µmhos/cm, as calculated based on the most recent quarterly source water sampling, or a maximum of 1000 µmhos/cm, whichever is less. The source water EC shall be determined as a weighted average.

The specific rationale for these limits is as follows:

BOD₅ and TSS: The Basin Plan requires WWTFs that are designed to discharge in excess of 1 million gallons per day to provide removal of 80 percent or reduction to 40 mg/L, whichever is more restrictive, of both 5-day BOD₅ and suspended solids (Basin Plan, p. V-10). However, as described below, federal regulations require publicly owned treatment works such as the WWTF to remove 85 percent and reduce to 30 mg/L both 5-day BOD and suspended solids. To ensure operation constancy, this order modifies

the Discharger's Discharge specifications so they meet the federal secondary treatment requirements. The maximum daily limit is calculated based on the 30-day average limit using the standard statistical procedures in the SIP and USEPA's March 1991 *Technical Support Document For Water Quality-based Toxics Control* (TSD) for describing effluent concentrations using a lognormal distribution.

Total Coliform Organisms:

Domestic wastewater contains pathogens harmful to humans that are typically measured by means of total or fecal coliform, as indicator organisms. California Department of Health Services (DHS), which has primary statewide responsibility for protecting public health, has established statewide criteria in Title 22, CCR, Section 60301 et seq., (hereafter Title 22) for the use of recycled water.

The 1988 Memorandum of Agreement (MOA) between DHS and the State Board on the use of recycled water establishes basic principles relative to the agencies and the Regional Boards. In addition, the MOA allocates primary areas of responsibility and authority between these agencies, and provides for methods and mechanisms necessary to assure ongoing, continuous future coordination of activities relative to the use of recycled water in California.

Title 22 criteria do not apply to recycled water uses at WWTFs. Nonetheless, recycled water discharges at the WWTF would be consistent with Title 22, CCR, Section 60304(d), which requires recycled wastewater used for the surface irrigation fiber, fodder, and seed crops not for human consumption to be at least undisinfected secondary recycled water.

Order No. 97-106 required wastewater discharged to storage meet a 7-day median of 23 MPN/100 mL and a daily maximum of 500 MPN/100 mL when groundwater was less than five feet below the ground surface. This requirement was to ensure that wastewater percolating to groundwater below holding pond inverts was adequately filtered. This Order carries over the 23 MPN/100 mL limit, but implements it as a 7-sample median for discharges of seven days or more and a median of samples collected if the discharge occurs for less than seven days. This Order also reduces the daily maximum limit to 240 MPN/100 mL to make it consistent with the limit for surface water discharge.

Chloride and Boron: Chloride and boron limits for Discharge 001 are based on requirements in the Basin Plan for municipal and domestic wastewater discharges to land, which states that "Discharges to areas that may recharge to good quality groundwaters shall not exceed...a chloride content of 175 mg/L, or a boron content of 1.0 mg/L" (Basin Plan, p. IV-11).

EC: Effluent limitations for EC for Discharge 001 are based on the maximums allowed by the Basin Plan and require that the maximum EC of the discharge shall not exceed the source water EC plus 500 µmhos/cm, or a maximum of 1000 µmhos/cm, whichever is less. The source water EC shall be determined as a weighted average.

State Water Resources Control Board (State Board) Resolution No. 68-16 (hereafter Resolution 68-16) requires the Regional Board in regulating discharge of waste to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people

of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Board's policies (e.g., quality that exceeds water quality objectives). Resolution 68-16 requires that the discharge be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

Domestic wastewater contains constituents such as total dissolved solids (TDS), EC, pathogens, nitrates, organics, metals and oxygen demanding substances (BOD). The discharge to land, with disposal by percolation, may result in an increase in the concentration of these constituents in groundwater. The increase in the concentration of these constituents in groundwater must be consistent with Resolution 68-16. Any increase in pollutant concentrations in groundwater must be shown to be necessary to allow wastewater utility service necessary to accommodate housing and economic expansion in the area and must be consistent with maximum benefit to the people of the State of California. Some degradation of groundwater by the Discharger is consistent with Resolution 68-16 provided that:

- The degradation is limited in extent;
- The degradation after effective source control, treatment, and control is limited to waste constituents typically encountered in municipal wastewater as specified in the groundwater limitations in this Order;
- The Discharger minimizes the degradation by fully implementing, regularly maintaining, and optimally operating best practicable treatment and control (BPTC) measures; and
- The degradation does not result in water quality less than that prescribed in the Basin Plan.

3.3 Effluent Limitations for Discharge 002

This Order includes the following limits for Discharge 002:

Constituent	Units	Average Monthly Limitation	Average Weekly Limitation	7-Sample Median	Maximum Daily Limitation
BOD ₅ ¹	mg/L	30	45	--	60
	lb/day ²	500	750	--	1000
Total Suspended Solids (TSS)	mg/L	40	45	--	60
	lb/day ²	670	750	--	1000
Settleable Solids	mL/L	0.1		--	0.5
Total Coliform Organisms	MPN ³ /100 mL	--	--	23	240
Total Residual Chlorine	mg/L				0.01
Chloride	mg/L	--	--	--	175
	lb/day ²	--	--	--	2920
Boron	mg/L	--	--	--	1.0
	lb/day ²	--	--	--	16.7
Un-ionized Ammonia	mg/L	--	--	--	0.025
(NH ₃ as N)	lb/day ²	--	--	--	0.42

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Constituent	Units	Average Monthly Limitation	Average Weekly Limitation	7-Sample Median	Maximum Daily Limitation
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¹ Five-day, 20°C biochemical oxygen demand (BOD)

² Based on a design flow of 2.0 mgd; lb/day = flow (mgd) x concentration (mg/L) x 8.34 lb/(mg/L x mgal)

³ MPN = Most Probable Number

- The arithmetic mean of 20°C BOD (5-day) and total suspended solids (TSS) in effluent samples collected from Discharge 002 over a monthly period shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85 percent removal).
- Discharge 002 shall not have a pH less than 6.5 nor greater than 8.3 standard units at any time.
- The maximum EC of the Discharge 002 shall not exceed the source water EC (at 25°C) plus 500 µmhos/cm, as calculated based on the most recent quarterly source water sampling, or a maximum of 1,000 µmhos/cm, whichever is less. The source water EC shall be determined as a weighted average.
- Survival of aquatic organisms in 96-hour bioassays of undiluted waste, as specified in the attached Monitoring and Reporting Program, shall be no less than:

Minimum for any one bioassay.....70%

Median for any three or more consecutive bioassays.....90%

The specific rationales for these limitations are as follows:

Dilution: Water quality-based effluent limitations in this Order apply at the point of discharge, as at times the discharge is the only flow in Sand Creek and there is no dilution.

Mass-based limits: Mass-based limits are calculated using the applicable concentration limit and the design flow of the WWTF. (See examples below for BOD₅ and TSS.)

BOD₅ and TSS: Final effluent limitations for BOD₅ and TSS are based on secondary treatment standards at 40 CFR 133.102, which require that BOD₅ and TSS not exceed a 30-day average of 30 mg/L and a 7-day average of 45 mg/L and that the average percent removal of BOD₅ and TSS be no less than 85%. The maximum daily limit is calculated based on the 30-day average limit using the standard

statistical procedures in the SIP and USEPA's TSD for describing effluent concentrations using a lognormal distribution. Using these procedures, the ratio of the maximum daily limit to the average monthly limit is 2.01.

Mass-based limit calculation for BOD₅ and TSS:

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Given: Conversion factor = 8.34 (lb)(l)/(mg)(Mgal)
Design flow = 2.0 mgd

Monthly Average = 30 mg/L X 8.34 X 2.0 mgd = **500 lbs/day**

Weekly Average = 45 mg/L X 8.34 X 2.0 mgd = **750 lbs/day**

Daily Max = 60 mg/L X 8.34 X 2.0 mgd = **1000 lbs/day**

pH: The Basin Plan requires that the pH of receiving waters shall not be depressed below 6.5 or raised above 8.3 standard units. As the discharge is at times the only flow in Sand Creek, these limits are applied directly to the discharge. These requirements are more stringent than the pH requirements based on secondary treatment standards at 40 CFR 133.102.

Settleable Solids: Effluent limits for settleable solids are based on limitations from Order No. 97-106 and were developed to attain the Basin Plan narrative water quality objective for settleable matter.

Total Coliform Organisms:

Title 22 criteria do not apply directly to discharges to waters of the State (e.g., creeks, streams, etc.). DHS drafted *Uniform Guidelines for Wastewater Disinfection* (retyped in November 2000) (Guidelines) that

recommends treatment and disinfection levels for discharges to waters of the State. The Guidelines recommend effluent have a median coliform bacteria most probable number (MPN) not exceeding 23/100 mL when:

- a. Discharges are to ephemeral streams that have little or no natural flow during all or part of the year,
- b. There is no nearby habitation,
- c. Recreation is not identified as a beneficial use, and
- d. Contact with the effluent is not encouraged.

Habitation downstream of the discharge is sparse and there is limited opportunity for contact with the Sand Creek in the vicinity of the discharge. The WWTF is prohibited from discharging to Sand Creek during the summer months when upstream flow in the creek is most likely to be low or nonexistent. Discharges are only permitted from November 1 through April 30 when dilution flows are more likely and cooler temperatures will discourage REC-1 and REC-2 uses. As the conditions of discharge are similar to a. -d. above, it is appropriate to apply an effluent limit restricting median coliform concentrations from exceeding 23 MPN/100 mL for discharges to Sandy Creek. In Order No. 97-106, the 23 MPN/100 mL requirement was implemented as a 7-day median limit. This Order specifies a 7-day median limit except when the discharge occurs for less than 7-days, at which time it specifies a median of all samples collected during the period of discharge. The daily maximum requirement for

total coliform of 240 MPN/100 mL is carried over from Order No. 97-106. This Order requires daily sampling for total coliform during discharges to Sand Creek.

Chloride and Boron: These limits are based on requirements of the Basin Plan for municipal and domestic wastewater discharges to surface waters, which states that “Discharges shall not exceed...a chloride content of 175 mg/L, or a boron content of 1.0 mg/L” (Basin Plan, p. IV-10).

EC: These limitations are based on the requirements in the Basin Plan for discharges of municipal or domestic wastewater to surface waters (p. IV-10) which require that the maximum EC shall not exceed the quality of the source water plus 500 μ mhos/cm or 1,000 μ mhos/cm, whichever is more stringent.

Ammonia: Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrate, and denitrification is a process that converts nitrate to nitrogen gas, which is then released to the atmosphere. Wastewater treatment facilities commonly use nitrification process to remove ammonia from the waste stream. Inadequate or incomplete nitrification may result in the discharge of ammonia to the receiving stream.

In water, un-ionized ammonia (NH_3) exists in equilibrium with the ammonium ion (NH_4^+). The toxicity of aqueous ammonia solutions to aquatic organisms is primarily attributable to the un-ionized ammonia form, with the ammonium ion being relatively less toxic. Total ammonia refers to the sum of these two forms in aqueous solutions. Analytical methods are used directly to determine the total ammonia concentration, which is then used to calculate the un-ionized ammonia (toxic) concentration in water. USEPA found that as pH increased, both the acute and chronic toxicity of ammonia increased. The Basin Plan states, “Waters shall not contain un-ionized ammonia in amounts which adversely affect beneficial uses. In no case shall the discharge of wastes cause concentrations of unionized ammonia (NH_3) to exceed 0.025 mg/L (as N) in receiving waters.” Ammonia limits are based on application of this water quality objective with no dilution allowance.

Acute Whole Effluent Toxicity: The Basin Plan includes a narrative objective for toxicity, requiring that all waters shall be maintained free of toxic substances in concentrations that are lethal to or produce other detrimental physiological responses in human, plant, animal, or aquatic life. Detrimental response includes but is not limited to decreased growth rate, decreased reproductive success of resident or indicator species, and/or significant alternations in population, community ecology, or receiving water biota. Acute whole effluent toxicity limits are based on interpretation of the narrative water quality objective for toxicity in the Basin Plan and requirements in Section 4 of the SIP.

3.4 Reasonable Potential Analysis (RPA)

As specified in 40 CFR 122.44(d)(1)(i), permits are required to include water quality-based effluent limitations (WQBELs) for all pollutants which “are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality

standard.” Thus, the fundamental step in determining whether or not a WQBEL is required is to assess the reasonable potential for concentrations of pollutants in an effluent to cause or contribute to an excursion of the applicable water quality objective (WQO) or water quality criterion (WQC). The following section describes the “reasonable potential analysis” or RPA methodology and the results of such an analysis for priority pollutants, as identified in the National Toxics Rule (NTR) and California Toxics Rule (CTR).

- a. *WQOs and WQC*: The RPA involves the comparison of effluent data and receiving water data with appropriate WQC in the CTR or NTR and, as applicable, WQOs in the Basin Plan or other numeric criteria.
- b. *Methodology*: The Regional Board conducted the RPA using the method and procedures prescribed in Section 1.3 of the SIP. Effluent and background data and the nature of WWTF operations are analyzed to determine if the discharge has reasonable potential to cause or contribute to exceedances of applicable WQOs or WQC.
- c. *Effluent and background data*: Letters sent by the Regional Board to the Discharger dated 27 February 2001, 8 May 2001 and 27 February 2002 required the Discharger to submit at least two days of effluent and receiving water data on priority pollutants. The Discharger submitted no priority pollutant data for the receiving water and only one day of sampling data for the effluent. The RPA in this Order is based on effluent data collected by the Discharger on 26 April 2002. These are the same data reported in the most recent Report of Waste Discharge. Consequently, the RPA is only for priority pollutants for which effluent data were provided, and should be considered preliminary.
- d. *RPA determination*: The preliminary RPA results are summarized in the table below. Available data do not demonstrate reasonable potential for any of the priority pollutants.

Summary of Preliminary Reasonable Potential Analysis Results

# in CTR	PRIORITY POLLUTANTS	MEC or Method Detection Limit ¹ (µg/L)	Governing WQO/WQC (µg/L)	RPA Results ²
1	Antimony	2	4,300	No
2	Arsenic	3	150	No
3	Beryllium	1	No Criteria	Uo
4	Cadmium	1	0.45	No
5a	Chromium (III)	1	365.16	No
5b	Chromium (VI)	1	11.43	No
6	Copper	5	16.87	No
7	Lead	5	7.69	No
8	Mercury	0.0262	0.051	No
9	Nickel	10	93.76	No
10	Selenium	2	5.00	No
11	Silver	10	13.37	No
12	Thallium	1	6.30	No
13	Zinc	50	215.57	No
14	Cyanide	0.00001	5.20	No
15	Asbestos	0.2 (mil. per liter)	7 mil. per liter	Uo
16	2,3,7,8 TCDD	0.00000844	0.000000014	No
17	Acrolein	NA	780	Ud
18	Acrylonitrile	NA	0.66	Ud
19	Benzene	5	71	No
20	Bromoform	5	360	No
21	Carbon Tetrachloride	5	4.4	No
22	Chlorobenzene	5	21,000	No
23	Chlorodibromomethane	5	34	No
24	Chloroethane	5	No Criteria	Uo
25	2-Chloroethylvinyl ether	NA	No Criteria	Uo
26	Chloroform	5	No Criteria	Uo
27	Dichlorobromomethane	5	46	No
28	1,1-Dichloroethane	5	No Criteria	Uo
29	1,2-Dichloroethane	5	99	No
30	1,1-Dichloroethylene	5	3.2	No
31	1,2-Dichloropropane	5	39	No
32	1,3-Dichloropropylene	NA	1,700	Ud
33	Ethylbenzene	5	29,000	No
34	Methyl Bromide	5	4,000	No
35	Methyl Chloride	5	No Criteria	Uo
36	Methylene Chloride	25	1,600	No
37	1,1,2,2-Tetrachloroethane	5	11	No
38	Tetrachloroethylene	5	8.85	No

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# in CTR	PRIORITY POLLUTANTS	MEC or Method Detection Limit ¹ (µg/L)	Governing WQO/WQC (µg/L)	RPA Results ²
39	Toluene	5	200,000	No
40	1,2-Trans-Dichloroethylene	5	140,000	No
41	1,1,1-Trichloroethane	5	No Criteria	Uo
42	1,1,2-Trichloroethane	5	42	No
43	Trichloroethylene	5	81	No
44	Vinyl Chloride	5	525	No
45	2-Chlorophenol	5	400	No
46	2,4-Dichlorophenol	5	790	No
47	2,4-Dimethylphenol	5	2,300	No
48	2-Methyl- 4,6-Dinitrophenol	25	765	No
49	2,4-Dinitrophenol	50	14,000	No
50	2-Nitrophenol	5	No Criteria	Uo
51	4-Nitrophenol	25	No Criteria	Uo
52	3-Methyl 4-Chlorophenol	10	No Criteria	Uo
53	Pentachlorophenol	25	8.20	No
54	Phenol	10	4,600,000	No
55	2,4,6-Trichlorophenol	5	6.50	No
56	Acenaphthene	5	2,700	No
57	Acenaphthylene	5	No Criteria	Uo
58	Anthracene	5	110,000	No
59	Benzidine	NA	0.00054	Ud
60	Benzo(a)Anthracene	5	0.049	No
61	Benzo(a)Pyrene	5	0.049	No
62	Benzo(b)Fluoranthene	5	0.049	No
63	Benzo(ghi)Perylene	5	No Criteria	Uo
64	Benzo(k)Fluoranthene	5	0.049	No
65	Bis(2-Chloroethoxy)Methane	5	No Criteria	Uo
66	Bis(2-Chloroethyl)Ether	25	1.40	No
67	Bis(2-Chloroisopropyl)Ether	50	170,000	No
68	Bis(2-Ethylhexyl)Phthalate	5	5.90	No
69	4-Bromophenyl Phenyl Ether	5	No Criteria	Uo
70	Butylbenzyl Phthalate	5	5,200	No
71	2-Chloronaphthalene	5	4,300	No
72	4-Chlorophenyl Phenyl Ether	5	No Criteria	Uo
73	Chrysene	5	0.049	No
74	Dibenzo(a,h)Anthracene	5	0.049	No
75	1,2-Dichlorobenzene	5	17,000	No
76	1,3-Dichlorobenzene	5	2,600	No
77	1,4-Dichlorobenzene	5	2,600	No
78	3,3 Dichlorobenzidine	10	0.077	No
79	Diethyl Phthalate	5	120,000	No

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# in CTR	PRIORITY POLLUTANTS	MEC or Method Detection Limit ¹ (µg/L)	Governing WQO/WQC (µg/L)	RPA Results ²
80	Dimethyl Phthalate	5	2,900,000	No
81	Di-n-Butyl Phthalate	5	12,000	No
82	2,4-Dinitrotoluene	20	9.10	No
83	2,6-Dinitrotoluene	20	No Criteria	Uo
84	Di-n-Octyl Phthalate	5	No Criteria	Uo
85	1,2-Diphenylhydrazine	NA	0.54	Ud
86	Fluoranthene	5	370	No
87	Fluorene	5	14,000	No
88	Hexachlorobenzene	5	0.00077	No
89	Hexachlorobutadiene	5	50	No
90	Hexachlorocyclopentadiene	NA	17,000	Ud
91	Hexachloroethane	5	8.90	No
92	Indeno(1,2,3-cd)Pyrene	5	0.049	No
93	Isophorone	5	600	No
94	Naphthalene	5	No Criteria	Uo
95	Nitrobenzene	25	1,900	No
96	N-Nitrosodimethylamine	NA	8.10	Ud
97	N-Nitrosodi-n-Propylamine	25	1.40	No
98	N-Nitrosodiphenylamine	5	16	No
99	Phenanthrene	10	No Criteria	Uo
100	Pyrene	5	11,000	No
101	1,2,4-Trichlorobenzene	5	No Criteria	Uo
102	Aldrin	5	0.00014	No
103	alpha-BHC	0.1	0.013	No
104	beta-BHC	0.1	0.046	No
105	gamma-BHC	0.1	0.063	No
106	delta-BHC	0.1	No Criteria	Uo
107	Chlordane (303d listed)	2	0.00059	No
108	4,4'-DDT (303d listed)	0.1	0.00059	No
109	4,4'-DDE (linked to DDT)	0.1	0.00059	No
110	4,4'-DDD	0.1	0.00084	No
111	Dieldrin (303d listed)	0.1	0.00014	No
112	alpha-Endosulfan	0.1	0.0560	No
113	beta-Endosulfan	0.1	0.0560	No
114	Endosulfan Sulfate	0.1	240	No
115	Endrin	0.1	0.0360	No
116	Endrin Aldehyde	0.1	0.81	No
117	Heptachlor	0.1	0.00021	No
118	Heptachlor Epoxide	0.1	0.00011	No
119-125	PCBs sum	1.4	0.00017	No
126	Toxaphene	2	0.00020	No

¹ Maximum Effluent Concentration (MEC) in **bold** is the actual detected MEC, otherwise the MEC shown

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CUTLER-OROSI JOINT POWERS WASTEWATER AUTHORITY WWTF

TULARE COUNTY

# in CTR	PRIORITY POLLUTANTS	MEC or Method Detection Limit ¹ (µg/L)	Governing WQO/WQC (µg/L)	RPA Results ²
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¹ is the Method Detection Limit. NA = Not Available (there are no monitoring data for this constituent).

² RP = Yes, if either MEC or Background > WQO/WQC.

RP = No, if (1) both MEC and background < WQO/WQC or (2) no background and all effluent data non-detect, or no background and MEC < WQO/WQC (per WQ 2001-16 Napa Sanitation Remand)

RP = Ud (undetermined due to lack of data)

RP = Uo (undetermined if no objective or criterion promulgated).

- e. *Constituents with limited data:* Reasonable potential could not be determined for some of the priority pollutants due to (i) WQOs/WQC that are lower than current analytical techniques can measure, (ii) the absence of applicable WQOs or WQC, or (iii) the absence of background data. Reasonable potential will be reevaluated in the future to determine whether there is a need to add numeric effluent limits to the permit or to continue monitoring. In addition, this Order requires the Discharger to monitor priority pollutants one time during the final year of the permit to provide additional data for future RPAs.
- f. *Pollutants with no reasonable potential:* WQBELs are not included in this Order for constituents that do not have reasonable potential to cause or contribute to exceedance of applicable WQOs or WQC. After the collection of more data, if concentrations or mass loads of these constituents are found to have increased significantly, the Discharger may be required to investigate the source(s) of the increase(s) or undertake remedial measures if the increases pose a threat to water quality in the receiving water.
- g. *Permit Reopener:* The permit includes a reopener provision to allow numeric effluent limits to be added for any constituent that in the future exhibits reasonable potential to cause or contribute to exceedance of a WQO or WQC. The Regional Board will make this determination based on monitoring results.

4. Basis for Recycled Water Specifications

Recycled Water Specifications are included in this Order to protect public health and to ensure that beneficial uses for surface water and groundwater specified in the Basin Plan are protected from the effects of potential discharges and to comply with requirements for recycled water. Most of these requirements are carried over from Order 97-106.

5. Basis for Pond/Lagoon Specifications

Pond specifications consisting primarily of management practices are included in this Order to ensure that beneficial uses for surface water and groundwater specified in the Basin Plan are protected. The discharge must be treated to prevent health hazards, contamination, and nuisance problems and must be managed to reduce salt contributions. Effective water quality management must respond to many

factors such as water use, land use, social and economic needs, and various other activities within the Basin.

6. Basis for Sludge Disposal Specifications

Sludge disposal provisions are based on the requirements of Title 27 CCR for the prevention of unauthorized discharge of sludge or solid wastes into waters of the State. The requirement to submit a Sludge Management Plan is based on a finding that, at the time of the most recent WWTF inspection, sludge from more than two years of WWTF operations was being stored on-site.

7. Basis for Receiving Water Limitations

Receiving water limitations are based on water quality objectives from the Basin. They are included to ensure protection of beneficial uses of receiving waters. The Regional Board may require an investigation to determine cause and culpability prior to asserting that a violation has occurred.

Dissolved oxygen: For water bodies designated as having warm freshwater aquatic habitat as a beneficial use, the Basin Plan includes a water quality objective of maintaining a minimum of 5.0 mg/L of dissolved oxygen. The Basin Plan also requires that “the monthly median of the mean daily dissolved oxygen (DO) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation.” These objectives are included as receiving water limitations in this Order

Total coliform organisms: For water bodies designated as having contact recreation as a beneficial use, the Basin plan includes a water quality objective stating that “the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 mL nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 mL.” This objective is included as a receiving water limitation in this Order.

Turbidity: The Basin Plan states that “Waters shall be free of changes in turbidity that cause nuisance or adversely effect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

- Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.
- Where natural turbidity is between 5 and 10 NTUs, increases shall not exceed 20 percent.
- Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTU.
- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

This Order includes receiving water limitations for turbidity based on the water quality objective described in the Basin Plan.

pH: For all surface water bodies in the Tulare Lake Basin, the Basin Plan includes a water quality objective for pH in surface waters, which states, “The pH shall not be depressed below 6.5 nor raised above 8.3 or changed at any time more than 0.3 units from normal ambient pH.” This Order includes receiving water limitations for pH based on this water quality objective.

Temperature: The Basin Plan includes the following objective: “Elevated temperature wastes shall not cause the temperature of waters designated COLD or WARM to increase by more than 5°F above natural receiving water temperature.” This Order includes a receiving water limitation for temperature based on this water quality objective.

8. Basis for Groundwater Limitations

The Basin Plan states that “[g]round waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses.” The beneficial uses of the groundwater in the Detailed Analysis Unit (DAU) 239 of the King’s Basin Hydrologic Unit (HU) are municipal supply (MUN), agricultural supply (AGR), industrial service supply (IND), and industrial process supply (PRO). Groundwater limitations included in this Order implement Basin Plan water quality objectives for groundwater and protect the beneficial uses of groundwater in the Basin from potential effects of pollutants in Discharge 001 and percolation from the holding ponds.

Water Quality Objectives

Basin Plan water quality objectives to protect the above beneficial uses include a numerical objective for coliform and narrative objectives for chemical constituents in and toxicity of groundwater. The toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, or animals. The chemical constituent objective states groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use. The Basin Plan references maximum contaminant levels (MCLs) in Title 22, CCR (i.e., §64431 (Inorganic Chemicals); §64431 (Fluoride); §64443 (Radioactivity); §64444 (Organic Chemicals); and §64449 (Secondary MCLs - Consumer Acceptance Limits)).

Quantifying a narrative water quality objective requires a site-specific evaluation of each waste constituent for consistency with the narrative objective using the translation procedures set forth in the Basin Plan. These procedures require the consideration of, among other things, site-specific hydrogeologic and land use factors and relevant numerical criteria and guidelines developed or published by other agencies and organizations.

The major constituents of concern in assessing the quality of water for agriculture are salinity (expressed as EC or TDS), boron, chloride, and sodium. The salt tolerance of crops also depends on the frequency and type of irrigation (e.g., drip, furrow, or sprinkler irrigation). Boron is an essential element but can become toxic to some plants when concentrations in water even slightly exceed the amount required for optimal growth. Like salt tolerance, boron tolerance varies with the climate, the soil, and the crop.

In determining the concentrations of salinity, boron, chloride, and sodium in groundwater associated

with no adverse affects on agricultural beneficial use in a given area, it is likely that multiple criteria apply.

In the process of crop irrigation, evaporation and crop transpiration remove water from and result in accumulation of residual salts in the soil root zone. These salts would retard or inhibit plant growth except for a fraction of irrigation water applied to leach the harmful salt from the root zone. The leached salts eventually enter groundwater.

The Basin Plan sets maximum effluent salinity limits for discharges of treated municipal and domestic wastewater to land. It specifically states the maximum EC shall not exceed the EC of the source water plus 500 $\mu\text{mhos/cm}$. It also states that discharges to areas that may recharge to good quality groundwater shall not exceed an EC at 1000 $\mu\text{mhos/cm}$, a chloride concentration of 175 mg/L, or a boron concentration at 1.0 mg/L.

The Discharger grows fodder, fiber, and seed crops on its 106 acre reuse area. The crops consist sudan grass in the summer and winter wheat or occasionally natural clover in the winter. Both sudan grass and winter wheat are moderately salt tolerant. The Discharger has not provided a list of the types of crops grown, or that could be grown, within the influence of its discharge. Additional information is necessary to determine existing and potential local cropping patterns for areas potentially affected by the discharge.

Groundwater Degradation/Limitations

Domestic wastewater contains constituents such as oxygen demanding substances (i.e., BOD₅), salinity constituents, pathogens, nutrients (e.g., nitrate), organics, and metals. Excessive residual organic carbon in percolating effluent can cause elevated concentrations of dissolved manganese and iron in groundwater is symptomatic of inadequate containment or treatment. Discharge to land in a manner that allows waste infiltration and percolation may result in an increase in the concentration of one or more of these constituents in groundwater. To be permissible, any increase in the concentration of these constituents in groundwater must be consistent with the antidegradation provisions of Resolution 68-16. Some degradation of groundwater by the Discharger is consistent with Resolution 68-16 provided that the degradation is:

- j. Limited in extent;
- k. Restricted to waste constituents characteristic of municipal wastewater and not totally removable by best practicable treatment and control (BPTC) measures;
- l. Minimized by fully implementing, regularly maintaining, and optimally operating BPTC measures;
- m. Demonstrated to be consistent with WQOS prescribed in the basin plan; and
- n. Justified to be consistent with the maximum benefit to the people of California.

Data from May 1996 through September 2004 indicate elevated levels of nitrate as nitrogen in Well B (10.9 mg/L) and Well D (10.1 mg/L) as compared to the average in Well A (5.7 mg/L), which is up-gradient. Averages in Wells C (4.2 mg/L) and E (5.5 mg/L) are near or below the average level in Well A (5.7 mg/L). The levels of nitrate-nitrogen in Wells B (10.9 mg/L) and D (10.1 mg/L) are above the

MCL of 10 mg/L nitrate + nitrite (sum as nitrogen) in Title 22. Well A (background) nitrate levels were 5.5 mg/L in 1996, dropping to 4.3 mg/L in 2000 before rising to 8.5 mg/L in 2004. During the same period, Well B nitrate levels dropped from a high of 14 mg/L in 1996, through 11 mg/L in 2000 to a low of 8.2 mg/L in September 2004. Well D follows a similar trend over the same time period, dropping from a high of 14 mg/L in 1996 through 10 mg/L in 2000 to a low of 8.8 mg/L in September 2004. Well C's nitrate trend is rather different, starting at 4.4 mg/L in 1996, dropping to 3 mg/L in 1998 before increasing to a high of 6.5 mg/L in 2002, and finally dropping again to 5.8 mg/L in 2004. The nitrate level in Well E in 1996 was a low of 5 mg/L, rising to 6.4 mg/L in 2000, peaking at 6.5 mg/L in March 2002, before dropping to 5.2 mg/L in 2004.

EC in Well A is typically in the 400 to 500 μ mhos/cm range while Wells B, C, D and E show conductivities in the 750 to 1150 μ mhos/cm range. Sodium, chloride, calcium, magnesium, carbonate and sulfate levels in the monitoring wells are generally two to four times higher in Wells B, C, D and E than in Well A.

All wells, except Well A, show degradation from salts.

It is unclear if the apparent degradation has been caused by WWTF discharges. Further, the network is not adequate to determine impacts from sludge storage or drying practices or the holding ponds as the wells do not appear to be adequately positioned to assess groundwater quality upgradient of and in the vicinity of these units.

Certain aspects of the WWTF do not reflect BPTC. The WWTF uses unlined sludge beds and unlined sludge storage lagoons and groundwater is shallow. Inspections have shown that the Discharger has failed to periodically remove accumulated sludge from unlined ponds, lagoons, and beds. The Discharger has also not adequately maintained WWTF equipment (e.g., flow monitoring devices, sampling devices, clarifier/digesters, trickling filters, etc.) to ensure compliance with WDRs Order No. 97-106. This Order requires the Discharger to evaluate its sludge treatment, storage, and disposal practices and its operation and maintenance practices with respect to BPTC.

As described above, the current groundwater monitoring network is generally insufficient to determine the area affected, or the area that could potentially be affected, by the WWTF discharge. Wells are impacted by salts and nitrate; however, there is not currently enough information regarding the crops grown in the area affected or potentially affected by the discharge to set salinity related numerical groundwater quality limits.

This Order requires the Discharger to assemble the technical information necessary for this Regional Board to determine the area potentially affected by the discharge, the controlling beneficial uses of groundwater, and to derive appropriate numerical groundwater quality objectives for the WWTF that are consistent with the Basin Plan. Following the completion of the studies to obtain the required technical information, this Order will be reopened to consider final numerical groundwater limitations. Until this

time, it is reasonable to employ, where appropriate, interim narrative groundwater quality limitations that proscribe an adverse affect on the beneficial uses of groundwater within the area potentially impacted by the discharge. These groundwater limitations will not result in groundwater quality that exceeds objectives set forth in the Basin Plan.

9. Basis for Key Provisions

Specific rationale for key Provisions are as follows:

- I.7 Provision I.7 requires the Discharger to conduct hydrogeologic investigations, groundwater monitoring and the submittal of technical reports, necessary to determine compliance with and aid in the development of this Order's groundwater limitations and BPTC implementation.
- I.8 Provision I.8 requires the Discharger to evaluate its WWTF with respect to BPTC to determine modifications necessary to comply with Resolution 68-16.
- I.9 Provision I.9 requires the Discharger to conduct various studies to gather data necessary to set numeric groundwater limitations.
- I.15 Chronic toxicity monitoring requirements are based on Section 4 of the SIP.
- I.17 The requirements to update the existing Operations and Maintenance Manual and to maintain the manual and a current maintenance log are based on results of the most recent WWTF inspection indicating a backlog of needed maintenance.
- I.25 The provision allowing the permit to be re-opened is based on 40 CFR 122.62

10. Basis for Self-Monitoring Requirements

As noted above, monitoring requirements are given in the Monitoring and Reporting Program (MRP) of this Order are based on 40 CFR 122.44(i), 122.62, 122.63 and 124.5. The monitoring and reporting program is issued pursuant to CWC Sections 13383 and 13267 and is required to assess compliance with the requirements in this Order. The MRP specifies sampling, analytical, and reporting requirements in accordance with NPDES regulations, the CWC, and Regional Board policies.

Receiving water monitoring requirements are based on the Basin Plan and authorized by CWC Section 13267.

The Discharger is required to conduct sludge monitoring, water supply monitoring, holding pond monitoring, groundwater monitoring, and recycled water monitoring in order to evaluate compliance with the Order. The monitoring reports are necessary to evaluate impacts to waters of the state to assure protection of beneficial uses and compliance with Regional Board plans and policies, including

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Resolution 68-16. Evidence in the record includes effluent monitoring data that indicates the presence of constituents that may degrade groundwater and surface water.

Reopener

The conditions of discharge in this Order were developed based on currently available technical information, currently available discharge and surface water quality information, applicable water quality laws, regulations, policies, and plans, and are intended to assure conformance with them. However, information is presently insufficient to develop all applicable final effluent limitations. Additional information must be developed and documented by the Discharger as required by schedules set forth in this Order. As this additional information is obtained, decisions will be made concerning the best means of assuring the highest water quality possible and that could involve substantial cost. It may be appropriate to reopen this Order if applicable laws and regulations change, or if new information necessitates the implementation of new or revised effluent limitations to adequately protect water quality.

California Environmental Quality Act (CEQA)

The action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the CEQA (Public Resources Code Section 21000 et seq.) in accordance with CWC Section 13389.